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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/780,184	02/09/2001	Craig S. Gittleman	8540G-000038 (GP-300032)	3194

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EXAMINER	
RIDLEY, BASIA ANNA	

ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/780,184	GITTLEMAN ET AL.	
	Examiner Basia Ridley	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-11,14,16-19,21-45 and 47-49* is/are pending in the application.

4a) Of the above claim(s) *19,24 and 31-45* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-11,14,16-18,21-23,25-30 and 47-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *122004*.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claim(s) 2-7, 9-11, 14, 16-18, 21-23, 27-30 and 47-49 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-34 of U.S. Patent No. 6,692,545.

Regarding claim 48 of the instant application, the claims 1-34 of U.S. Patent No. 6,692,545 recite the system comprising:

- a shift reactor including a reaction region having an inlet and an outlet (claim 1);
- a water gas shift catalyst disposed within said reaction region and extending to said outlet (claim 1); and
- a first carbon monoxide adsorbent disposed within said region between said inlet and said outlet (claim 8); wherein
- said shift reactor is adapted to receive a gas stream containing hydrogen and carbon monoxide and wherein said first adsorbent is active to adsorb carbon monoxide at substantially ambient temperature and pressure conditions and to desorb carbon monoxide at normal shift reactor

operating temperature and pressure conditions (claim 9).

While the claims 1-34 of U.S. Patent No. 6,692,545 recite that the shift reactor is a rotating pressure swing adsorber vessel including two fixed valve faces, an adsorption region, a depressurization region, a purge region and a pressurization region (claims 1 and 6) said claims do not explicitly recite a second a rotating pressure swing adsorber vessel including a second carbon monoxide adsorbent in fluid communication with said outlet of said shift reactor. It would have been obvious to one having ordinary skill in the art at the time the invention was made to add an additional rotating pressure swing adsorber vessel including a second shift catalyst and a second carbon monoxide adsorbent, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. Further, it has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 124 USPQ 378, 380 (CCPA 1960).

Regarding claims 21, 23 and 27-28 of the instant application, the claims 1-34 of U.S. Patent No. 6,692,545 recite the system comprising:

- further comprising an expander downstream of the vessel, and wherein the expander provides a purge gas to be fed back into the vessel (claim 12);
- wherein the expander is an isothermal expander adapted to provide electrical power for driving the rotating vessel (claim 13);
- wherein the first adsorbent is selected from the group consisting of oxides or salts of copper impregnated or exchanged on activated carbon, alumina and zeolites; oxides or salts of silver impregnated or exchanged on activated carbon, alumina and zeolites; oxides or salts of tin impregnated or exchanged on activated carbon, alumina and zeolites; and mixtures thereof (claim

9);

- wherein upstream of the second carbon monoxide adsorbent the vessel comprises a layer of a desiccant material selected from the group consisting of zeolite molecular sieves, activated alumina, silica gels, and mixtures thereof (claims 10-11).

Regarding claims 22 and 30 of the instant application, the claims 1-34 of U.S. Patent No. 6,692,545 recite the system further comprising:

- a fuel cell stack having an anode exhaust wherein the expander expands the anode exhaust, the expanded anode exhaust providing the purge gas to be fed back to the vessel (claim 14);
- wherein the preferential oxidizer is eliminated from the hydrogen fuel cell system (claims 1-34).

While the claims 1-34 of U.S. Patent No. 6,692,545 do not explicitly recite the fuel cell stack disposed between the vessel and the expander, it would have been obvious to one having ordinary skill in the art at the time the invention was made to rearrange positions of the expander and the fuel cell, since it has been held that rearranging parts of an invention involves only routine skill in the art, *In re Japikse*, 86 USPQ 70 and since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art, *In re Einstein*, 8 USPQ 167.

Regarding claims 49, 7, 14 and 29 of the instant application, the claims 1-34 of U.S. Patent No. 6,692,545 recite the system comprising:

- a shift reactor including a reaction region having an inlet and an outlet (claim 1);
- a water gas shift catalyst disposed within said reaction region and extending to said outlet (claim 1); and
- a carbon monoxide adsorbent disposed within said region between said inlet and said outlet (claim 8); wherein

- said shift reactor is adapted to receive a gas stream containing hydrogen and carbon monoxide from an upstream reactor, and wherein said adsorbent is active to adsorb carbon monoxide at substantially ambient temperature and pressure conditions and to desorb carbon monoxide at normal shift reactor operating temperature and pressure conditions (claims 8-9 and 20).
- wherein the system is a fuel cell system (claim 14);
- wherein the preferential oxidizer is eliminated from the hydrogen fuel cell system (claims 1-34);
- wherein the water gas shift reactor is a high temperature water gas shift reactor (claim 2).

Regarding claim 47 of the instant application, while the claims 1-34 of U.S. Patent No. 6,692,545 recite that the shift reactor is a rotating pressure swing adsorber vessel including two fixed valve faces, an adsorption region, a depressurization region, a purge region and a pressurization region (claims 1 and 6) said claims do not explicitly recite a vessel including a second carbon monoxide adsorbent in fluid communication with said outlet of said shift reactor. It would have been obvious to one having ordinary skill in the art at the time the invention was made to add an additional rotating pressure swing adsorber vessel including a second shift catalyst and a second carbon monoxide adsorbent, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. Further, it has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 124 USPQ 378, 380 (CCPA 1960).

Regarding claims 2-6, 9-11, 16 and 18 of the instant application, the claims 1-34 of U.S. Patent No. 6,692,545 recite the system comprising:

- wherein the vessel is a pressure swing adsorber (claim 1 and 6);
- wherein the pressure swing adsorber comprises multiple staged fixed beds (claim 4);

- wherein the pressure swing adsorber is a rotating vessel (claim 1);
- wherein the rotating vessel comprises an adsorption region, a depressurization region, a purge region and a pressurization region (claim 6);
- wherein the rotating vessel comprises two fixed valve faces (claim 1 and 7);
- wherein at least one of the first and second adsorbent is selected from the group consisting of oxides or salts of copper impregnated or exchanged on activated carbon, alumina and zeolites; oxides or salts of silver impregnated or exchanged on activated carbon, alumina and zeolites; oxides or salts of tin impregnated or exchanged on activated carbon, alumina and zeolites; and mixtures thereof (claim 9);
- wherein upstream of the second adsorbent the vessel comprises a layer of a desiccant material (claim 10);
- wherein the desiccant material is selected from the group consisting of zeolite molecular sieves, activated alumina, silica gels, and mixtures thereof (claim 11);
- further comprising an expander downstream of the vessel, and wherein the expander provides a purge gas to be fed back into the vessel (claim 12);
- wherein the vessel is a rotating vessel, and wherein the expander is an isothermal expander adapted to provide electrical power for driving the rotating vessel (claim 13).

Regarding claim 17 of the instant application, the claims 1-34 of U.S. Patent No. 6,692,545 recite the system further comprising:

- a fuel cell stack having an anode exhaust wherein the expander expands the anode exhaust, the expanded anode exhaust providing the purge gas to be fed back to the vessel (claim 14);

While the claims 1-34 of U.S. Patent No. 6,692,545 do not explicitly recite the fuel cell

stack disposed between the vessel and the expander, it would have been obvious to one having ordinary skill in the art at the time the invention was made to rearrange positions of the expander and the fuel cell, since it has been held that rearranging parts of an invention involves only routine skill in the art, *In re Japikse*, 86 USPQ 70 and since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art, *In re Einstein*, 8 USPQ 167.

3. Claim(s) 8 and 25-26 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-34 of U.S. Patent No. 6,692,545 in view of in view of Meyer (USP 3,011,589).

Regarding claims 8 and 25-26 of the instant application, claims 1-34 of U.S. Patent No. 6,692,545 recite all of the claim limitations as set forth above, but they do not recite at least said second adsorbent being selected from the group consisting of 5A zeolite, 13X zeolite and mixtures thereof wherein the second adsorbent is further adapted to adsorb at least one of carbon dioxide and water from the hydrogen-rich gas stream.

Meyer teaches a system for production of hydrogen comprising a second adsorbent (C6/L5-14) adapted to remove carbon monoxide from gas comprising hydrogen and carbon monoxide, the system further comprising a first adsorbent (C4/L68-75) adapted to remove carbon monoxide, upstream said second adsorbent. Wherein at least one of the first and second adsorbent is selected from the group consisting of 5A zeolite, 13X zeolite, and mixtures thereof (C4/L68-75 and C6/L5-14) and wherein the first adsorbent is adapted to adsorb carbon monoxide at low temperatures and is adapted to desorb carbon monoxide at high temperatures (C6/L59-64 and C7/L25-28).

It would have been obvious to one having ordinary skill in the art at the time of the invention to use 5A zeolite, 13X zeolite, or mixtures thereof as the second adsorbent in the system

recited in claims 1-34 of U.S. Patent No. 6,692,545 as doing so would amount to nothing more than a use of a known material for its intended use in a known environment to accomplish entirely expected result.

Response to Arguments

4. Applicant's arguments filed on 21 December 2004 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. In view of the foregoing, none of the claims are allowed.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Basia Ridley, whose telephone number is (571) 272-1453.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola, can be reached on (571) 272-1444.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Technical Center 1700 General Information Telephone No. is (571) 272-1700. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Questions on access to the Private PAIR system should be directed to the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).

Basia Ridley
Examiner
Art Unit 1764

BR
January 21, 2005